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HARRITY SNYDER, LLP 11350 Randon Hills Road SUITE 600 FAIRFAX, VA 22030			EXAMINER EL-ZOOBI, MARIA	
			ART UNIT 2614	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 10/633,498	<b>Applicant(s)</b> BARSOUM ET AL.	
	<b>Examiner</b> MARIA EL-ZOOBI	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.                                                |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-3 and 8-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 4 recites "non-consecutive tone" (implying away to arrange the tones in the system), however, the claim does not recite how and in which way the tone are non-consecutive, whereby the claim is of unclear scope.

Claim 3 is rejected because it depends on a rejected claim.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 6-11 and 14-20 rejected under 35 U.S.C. 102(e) as being unpatentable by Matsumoto (US publication 200/0026346).

Regarding claim 1, Matsumoto discloses, in a discrete multi tone (DMT) system, a method for transmitting data between a first device and a second device (Paragraph 5-7), the method comprising:

allocating a predetermined number of bits of data for each of a plurality tones (Paragraph 0177)

transmitting redundant sets of data on each of a plurality of different tones (Paragraph 0080 and 0097, lines 9-11),

each redundant set including the predetermined number of bits of data (Paragraph 0180; the redundant data include 2 bits);

receiving the redundant sets of data by the second device (Paragraph 0080); and  
identifying the data represented by the redundant sets of data using a voting scheme (Paragraph 0080 and 0114; in the reception side, the identity of the bit will be decided by a decision unit which will use the redundant data and the information bits for comparison).

Regarding claim 2, Matsumoto discloses, the predetermined number of bits of data comprises one bit (Paragraph 0179, lines 14-14; only one bit of information) and the plurality of different tones comprises N tones (Paragraph 0085, 0178 and 0179; the tone ordering process will generate N different tones), wherein N is an odd integer (Paragraph 0180, lines 2-3; the 1 information bit is being transmitted on an odd tones 0, 1, 7, 9) and the transmitting comprises:

transmitting each bit of data on each of N non-consecutive tones (Paragraph 0178, lines 5-6).

Regarding claim 3, Matsumoto discloses, the identifying comprises: decoding the N tones (Paragraph 0081; the decoder will decode the received tones), and determining the identity of a data bit represented by a redundant set of data when than one half of the decoded N tones correspond to a particular value (Paragraph 0102 and 0103; the decoder will identify the bit using the maximum probabilities/majority to make the decision).

Regarding claim 6, Matsumoto discloses, the transmitting redundant sets of data is performed during a training period (Paragraph 0083; it is inherent that the system will send data for testing procedure before starting the actual transmission).

Regarding claim 7, Matsumoto discloses, the predetermined number of bits comprises a plurality of bits and the plurality of tones comprises N non-consecutive tones (Paragraph 0177 and 0179), wherein the identifying comprises: decoding the N non-consecutive tones to identify the plurality of bits (Paragraph 0081; the decoder will decode the received tones), and voting on the identity of each of the plurality of bits on a bit-by-bit basis (Paragraph 0102 and 0103; the decoder will identify the bit using the maximum probabilities/majority to make the decision; it is inherent that the identity is being decide on bit –by- bit basis because upon receiving the bit sequence, the decoder determine first if the received bit “0” or “1” then look at the next bit and so on ).

Regarding claim 8, Matsumoto discloses, a first device configured to

communicate using discrete multi tone (DMT) modulation (Paragraph 0082;  
communication apparatus operates using DMT), comprising:

logic configured to allocate a first number of bits of data for each of a plurality of tones (Fig. 3, el. 147 and Paragraph 0177)

logic configured to receive a redundant set of data via a plurality of tones from a second device (Fig. 3, el. 153, Paragraph 0087 and 0089; the reception side of the apparatus will receive data "which is inherently coming from another device" this data include information bits and redundant )and

logic configured to identify the data based on a voting scheme (Paragraph 0081 and 0106 the decision unit 22 will decide the identity of the bit after performing the process mentioned in the paragraph using the probability likelihood).

Regarding claim 9, Matsumoto discloses, the plurality of tones comprises N tones, where N is an odd integer, and the first number of bits of data comprises one bit (Paragraph 0179, lines 14-14; only one bit of information, Paragraph 0085, 0178 and 0179; the tone ordering process will generate N different tones, Paragraph 0180, lines 2-3; the 1 information bit is being transmitted on an odd tones 0, 1, 7, 9).

Regarding claim 10, Matsumoto discloses, the first device of comprising:  
logic configured to decode the data transmitted on each of the N tones and forward the decoded data (Fig. 1b and Paragraph 0101), and wherein the logic configured to identify the data (Fig. 3, el. 145 and Paragraph 0089, lines 1-7; the apparatus has an error correction logic, so it is inherent that the identity of the received bit must be identify first

to determine whether there is an error or not) comprises:

a voter configured to receive the decoded data, and determine that a bit is equal to a first value when more than one half of the decoded N tones correspond to the first value (Paragraph 0103; maximum probability inherently means more than a half).

Regarding claim 11, Matsumoto discloses, logic configured to transmit data in accordance with the allocation during at least a training period associated with the first device and the second device (Fig. 2, el. 53 and paragraph 0086).

Regarding claim 14, Matsumoto discloses, the device comprising:  
transmit logic configured to transmit redundant data on each of a plurality of different tones during a training period, wherein each of the plurality of different tones carries the first number of bits (Fig. 1, el. 1 and Paragraph 0097, lines 9-12).

Regarding claim 15, Matsumoto discloses, the logic configured to identify the data is configured to decode the received redundant set of data, and identify the data on a bit-by-bit voting (Paragraph 0081 and 0106 the decision unit 22 will decide the identity of the bit after performing the process mentioned in the paragraph using the probability likelihood; the limitation "bit-by-bit" is inherently met, that the decision unit will receive the first bit evaluate the value and then the next bit and so on).

Regarding claim 16, Matsumoto discloses, a first device configured to communicate in a discrete multi tone (DMT) system (paragraph 0082; communication

apparatus operates using DMT) comprising:

a transmitter configured to transmit redundant data on a first number of tones to a second device (Fig. 2 and paragraph 0083, 0085 and 0097, lines 9-11 teaches that the data been transmitted is a redundant data) and

a receiver configured to receive data transmitted on the first number of tones from the second device (Fig. 3, Paragraph 0087 and 0089)

decode the data received on the first number of tones, and determine the identity of the received data based on a predetermined rule (Paragraph 0089; using the maximum likelihood method to determine the identity of the bit).

Regarding claim 17, Matsumoto discloses, the predetermined rule includes: determining that a bit or group of bits is equal to a first value when more than one half of the decoded first number of tones corresponds to the first value (Paragraph 0089, and 0103; since the system using maximum likelihood probability, it is inherent that more than a half must correspond to a first value to determine the identity of the bit)

Regarding claim 18, Matsumoto discloses, when transmitting redundant data to the second device, the transmitter is configured to: transmit a predetermined number of bits representing the redundant data on each of the first number of tones (Paragraph 0179 and 0180; transmit a number of information bits and a number of redundant bits on different tones)

Regarding claim 19, Matsumoto discloses, the first number of tones comprises non-consecutive tones in the DMT system (Paragraph 0180; transmitting the data on

different tone sets, each set comprises a number of tones and these tones are arranged in non-consecutive way "i.e., 1, 7, 9).

Regarding claim 20, Matsumoto discloses, the first number of tones are separated by a maximum number of tones based on a total number of tones used in the DMT system (Paragraph 0042).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (US publication 200/0026346) in view of Poggiolini (US patent 6,621,617)

Regarding claim 4, Matsumoto discloses, transmitting a data bit that represent Information bit, however Matsumoto does not talk about the transmission of these bits on maximum or minimum power level.

Poggiolini discloses, transmitting a data bit representing a "1" with a maximum or near-maximum power level (Col. 3, lines 8-23).

Therefore, it would have been obvious to one with ordinary skill in the art, at the time the invention was made to modify Matsumoto transmission system to transmit the

data bit, as suggested by Poggiolini, in order to save power.

Regarding claim 5, Matsumoto in view of Poggiolini discloses, the transmitting further comprises: transmitting a data bit representing a "0" with a zero or near-zero power level (Matsumoto: Col. 3, lines 8-23).

Regarding claim 12, Matsumoto discloses, transmitting a data bit that represent Information bit, however Matsumoto does not talk about the transmission of these bits on maximum or minimum power level.

Poggiolini discloses, logic configured to transmit data is configured to transmit at a first power level for data representing a "1" and transmit at a second power level for data representing a "0." (Col. 3, lines 8-23).

Therefore, it would have been obvious to one with ordinary skill in the art, at the time the invention was made to modify Matsumoto transmission system to transmit the data as suggested by Poggiolini, in order to avoid interference.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (US publication 200/0026346) in view of Tellado (US 6,512,797).

Regarding claim 13, Matsumoto discloses, logic configured to transmit data

Matsumoto does not expressly disclose, that the logic is configured to transmit data representing a "1" using a first magnitude and phase and transmit data representing a "0" using a second magnitude and phase.

Tellado discloses, DMT communication system, where each signal "the signal

can carry any number of bits" is being represented by a different magnitude and phase (Col. 5, lines 17-37).

Therefore, it would have been obvious to one with ordinary skill in the art, at the time the invention was made, to modify Matsumoto system to assign each bit to different magnitude and phase, as suggested by Tellado, in order to improve the transmission of the data by avoiding the interference.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA EL-ZOOBI whose telephone number is (571)270-3434. The examiner can normally be reached on Monday-Friday (8AM-5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsng can be reached on 571-272-7547. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2614


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. E./

Examiner, Art Unit 4178

/Maria El zoobi/

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